ecoLogical solutions ltd
30 leigh street, po box 180, kāeo 0448
e: [redacted]
w: www.ecologicalsolutions.co.nz

7 September 2026

Environmental Protection Agency
Private Bag 63002
WELLINGTON 6140

Attention: Jessie Richardson, Application Lead
Cc: Trevor Robinson, Panel Chair

RE: FTAA-2603-1181 – Mt Welcome, Pukerua Bay, Porirua fast-track application.

Introduction

Pukerua Property Group Partnership has applied for approvals including resource consents, a wildlife permit, an archaeological authority and a complex freshwater fisheries approval to develop residential allotments, an allotment and preparatory works to enable a future commercial centre and associated infrastructure at 422A and 422B State Highway 59, Pukerua Bay under the Fast-track Approvals Act 2024 ('FTAA'). The proposal provides for 949 dwellings and a commercial centre and is located between two already consented large residential developments (Muri Road near Pukerua Bay and Plimmerton Farm on the northern edge of Porirua City).

The application was received by the Environmental Protection Agency ('the EPA') on 1 April 2026 and on 2 July 2026 the expert panel released Minute 3, recording their decision with respect to which parties were to be invited to comment on the application. The closing date for comments was 31 July 2026.

Twenty-seven interested parties were invited to provide comment, including (but not limited to) in relation to ecological matters:

1. Porirua City Council ('PCC');
2. The Director General of Conservation ('the D-G');
3. Greater Wellington Regional Council ('GWRC'); and
4. Te Rūnanga o Toa Rangatira ('Te Rūnanga').

Where these parties agree, they are referred to here as "the invited parties".

In July 2026 the author was retained by the EPA to provide ecological advice with respect to the application. This has included facilitating the expert conferencing in relation to lizards, terrestrial ecology and aquatic ecology and wetlands (held 18 August 2026), producing the associated joint witness statements and attending a site visit with Dr Vaughan Keesing (representing the applicant), Dr Nyree Fea (representing Porirua City Council) and Ms Tayla Hooker (representing the Director General of Conservation) on 31 August 2026 when we spent approximately four hours exploring the site on foot. I also attended the herpetofauna and terrestrial ecology conference with the Panel held on 3 September 2026 as an observer.

This letter sets out my findings to assist the panel in reaching their decision with respect to the application. Note that I have not commented on the draft proposed conditions for the Project since I understand an updated version is currently being prepared.

The Project

The Site is currently farmland located within Porirua City Council's jurisdiction situated approximately 15km north of Porirua City and 1.2km south of Pukerua Bay. The Site adjoins the eastern edge of State Highway 59 (formerly State Highway 1 – the main highway in and out of Wellington City and Porirua City).

The proposal includes:

- 949 residential allotments sized between 316m^2 and 2,386m^2;
- an allotment and preparatory works to enable a future commercial centre;
- associated infrastructure including wastewater (including wastewater storage facilities), stormwater, water reticulation, roading, and pedestrian and cycling trails;
- earthworks to establish the required finished surface levels for building platforms, roading, parks and drainage;
- landscaping; and
- a new intersection (in the form of a roundabout) with State Highway 59.

In terms of ecological effects, the proposal includes:

- Vegetation clearance including:
    - indigenous vegetation identified as significant in the Porirua District Plan (including parts of SNA 027 and SNA 029);
    - planted indigenous vegetation (referred to here as 'Shrubland 1');
    - weedy roadside vegetation with indigenous elements adjoining SH59 (referred to here as 'roadside scrub');
    - exotic and indigenous trees (primarily pine (*Pinus radiata*); and
    - exotic pasture.

  This vegetation provides habitat for indigenous birds, lizards (copper skinks (*Oligosoma aeneum*) and Northern grass skink (*O. polychroma*)) and may provide habitat for long-tailed bats (*Chalinolobus tuberculatus*).
- Effects on wetlands including removal.
- Effects on streams including:
    - removal of stream habitat;
    - piping of a length of Taupo Stream associated with the construction of the roundabout;
    - installation of culverts;
    - construction of five dams to create 'retention wetlands' to manage stormwater. These retention wetlands are also proposed as ecological offset to address loss of wetlands and streams as a result of the project.

Expert Conferencing

The Joint Witness statements relating to herpetology, terrestrial ecology and aquatic ecology and wetlands set out the positions of the relevant experts. I have not repeated those positions here, but have attempted to summarise the respective positions below.

Matters of Agreement

The nature of the effects are generally agreed, although little consideration has been given to cumulative effects.

The applicant's ecologists have used the Environmental Institute of Australia and New Zealand ('EIANZ') guidelines for Ecological Impact Assessment ('EcIA') in determining the magnitude and overall level of effect and the use of this method is accepted by all parties.

In relation to vegetation clearance, it is agreed that the majority of the vegetation at the Site comprises exotic pasture, exotic shelterbelts and exotic and native amenity planting. The extent of the different areas of vegetation to be cleared is not in dispute (although the value of these areas is disputed as set out below).

Matters of Contention

Below I have set out my thinking with respect to each of the areas of disagreement.

Application of the EIANZ EcIA guidelines

The various experts have interpreted the EIANZ EcIA guidelines in different ways (particularly with respect to scale) and this is the source of much of the contention. In particular, this difference of approach has implications for the interpretation of the overall level of effects attributed to the Project in relation to lizards, terrestrial ecology and aquatic habitats and wetlands. There are consequently differences of opinion with respect to how the effects management hierarchy has and/or should be applied. As a result, the overall level of effects arising from the Project and the sufficiency of actions to avoid, remedy, mitigate and offset those effects are disputed by the ecologists representing the applicant (Mr Payne and Dr Keesing) and those representing the interested parties (Dr Fea, Mr Wedding, Ms Hooker, Ms Price, Ms Dixon, Dr Taylor, Ms Jaspers, Mr Faulkner and Mr Blyth).

The 2018 EIANZ EcIA guidelines are voluntary guidelines with no legal standing. They were developed by ecologists experienced in the resource management sector in New Zealand to provide a standardised, scientifically robust, and transparent framework for assessing and reporting ecological impacts. The fact that they are transparent is an improvement on older methods of effects assessment (essentially relying on professional judgement and highly subjective), but by its very nature, this transparency leads to differences of opinion. Using the guidelines still requires professional judgement to apply them effectively.

The EIANZ EcIA process evaluates ecological impact by pairing the intrinsic ecological value of a feature (species, habitat, or ecosystem assigned to one of five scores ranging from 'negligible' to 'very high') with the magnitude of effect (considered further below). Assigning ecological value considers four attributes, develops a score for each and then amalgamates the four scores into a single value score. The attributes are:

- Representativeness
- Rarity/distinctiveness
- Ecological context
- Diversity and pattern

The magnitude of the effect is also assigned to one of five scores ranging from 'negligible' (barely perceptible change) to 'very high' (almost total removal). The scores for both value and magnitude are integrated via a matrix approach to derive an 'overall level of effect'.

A ‘low’ or ‘very low’ overall level of effect indicates that while an impact may occur, the ecological attribute under consideration will retain its baseline structural integrity, productivity, and resilience. In resource management terminology, these scores generally translate to effects that are ‘minor’ (for ‘low’) or ‘less than minor’ (for ‘very low’). Effects rated ‘low’ or ‘very low’ do not typically necessitate residual effects management in the form of biodiversity offsetting or ecological compensation. It is relevant to note that whether the scores are derived before the application of remediation and mitigation/minimisation actions are applied or after has a material impact on the need for offsetting or compensation (which are only applied to significant residual adverse effects after avoidance, remediation and mitigation have occurred).

With respect to scale, the application of different scales by different ecological experts is not uncommon. The EcIA guidelines refer to the Zone of Influence (‘the ZoI’), which is defined as the entire biophysical area where ecological effects may occur (e.g., including the Site and any downstream impacts (such as mobilisation of sediment or hydrological impacts) or adjoining terrestrial effects (such as edge effects)). The ZoI dictates *where* impacts are physically investigated. Assessing magnitude of effect at the level of the ZoI (spatial scale of the effects) is not recommended by the EcIA guidelines.

The August 2026 EIANZ Practice Update (‘the Explanatory Note’) explicitly clarifies that the magnitude of an effect must be assessed at the same spatial scale as the ecological value assessment. In terms of application of the guidelines, this means that if an ecological attribute is determined to have ‘high’ value locally, the magnitude of its loss must be quantified at the same local scale. The Explanatory Note explicitly warns against ‘zooming out’ to wider catchment, landscape, district, or national contexts to ‘dilute’ a localized impact (e.g., claiming a stream loss is "negligible" because the wider catchment is very large). The same argument applies in reverse – if the assessment is conducted at the scale of the site, the level of effects is magnified because all of the feature within the site is affected (e.g., removal of all of an element that is common and widespread outside the site if assessed at the site scale would lead to the conclusion that the loss is serious when such a conclusion may not be justified).

The 2026 EIANZ explanatory note confirms that consideration of wider geographic scales (such as the Ecological District or Region) are intended to provide narrative context, but should not be used to alter the baseline scale of the matrix assessment. In practical terms this means that if an expert argues that the loss of a native lizard population or a stream tributary is a ‘low’ level of effect because the species or habitat is abundant elsewhere in Wellington, they are not applying the guidelines as proposed. Each local population or stream reach must be evaluated on its own merits.

Having said that, it is considered appropriate to apply different scales to different ecological attributes, (e.g., nationally for nationally threatened species or locally for particular local vegetation types which do not occur elsewhere). The scale at which the assessment is undertaken should always be explicitly stated in the EcIA report.

On that basis, the panel can place more reliance on assessments of effect that have explicitly set out the scale of the assessment and maintained the same scale when assessing value and assessing effects than those which have not.

Terrestrial Ecology

The completeness of the terrestrial ecological surveys is a matter of contention, with the interested parties of the view that the lack of information contributes materially to the uncertainty of the overall level of ecological effects attributable to the Project. Specifically, the interested parties assert that the applicant has failed to provide a comprehensive assessment of the development's impact on local bird, bat, and vegetation communities,

meaning that the panel cannot fully determine if the overall terrestrial ecological effects will be acceptable. The applicant's experts have relied on surveys undertaken to inform the plan change (at least for bats) as well as their own ecological surveys undertaken to inform their assessment and consider that;

- the high-value ecological areas that could be avoided have been; and
- any outstanding risks to vegetation and wildlife can be safely managed via the approval conditions and particularly through the required ecological management plans which include
    - Lizard Management Plan (LMP):
    - Ecological Construction Management Plan (ECMP):
    - Erosion and Sediment Control Plan (ESCP):
    - Ecological Management Plan (EMP) including aspects such as wetland restoration, fish management, avifauna, weed and pest control.
    - The experts agreed during conferencing in relation to aquatic habitats and wetlands that an integrated ecological and hydrological management plan would be a useful addition.

The experts differ in their assessment of the ecological value of the different areas of vegetation to be cleared and therefore the overall level of effects and consequently whether, and to what extent, residual adverse effects attributable to vegetation loss remain. The applicant has proposed to offset the loss of vegetation that meets the criteria for ecological significance set out in the Porirua District Plan at a ratio of 3:1, noting that what is proposed does not include all the SNA vegetation mapped. The invited parties consider that offsetting should include all of the SNA vegetation as mapped, plus the extent of other indigenous vegetation at the Site, including indigenous vegetation forming the understorey of pine plantation. The applicant's ecologist (Dr Keesing) agreed at during conferencing to provide a draft Biodiversity Offset Accounting Model (BOAM) to address SNA vegetation loss. The panel will need to decide the applicability (or not) of this model in relation to the other vegetation clearance proposed (i.e., Shrubland 1, roadside scrub, other indigenous elements within pine blocks which have not been quantified). The assumption is that the outcome of the ratio generated by the BOAM for the SNA vegetation would be appropriate (and conservative) for other, lower value, vegetation at the Site. In my view this assumption is reasonable.

I note that the Landscape and Ecology Plans (provided as Appendix 23 of the updated application documents) include planting of c. 25.8ha of native vegetation across the Site. Given that the amount of indigenous vegetation to be removed is 7,436m^2 this represents a ratio of c. 34.7:1. This exceeds by an order of magnitude the amount of indigenous vegetation planting that the applicant's ecologist considers is required to offset vegetation loss (a ratio of 3:1), but the ecological value of this vegetation does not appear to have been taken into account as mitigation.

Lizards

In relation to lizards, the disagreement between the experts centres on uncertainties relating to the overall level of effects on lizards and the sufficiency of the lizard management plan to address those effects and protect native species under the Wildlife Act 1953.

Dr Fea (representing Porirua City Council) and Mr Wedding (representing the Director General of Conservation) are of the view that the application contains critical information gaps regarding the true extent of the distribution of lizard populations (particularly copper

skinks which are regarded as ‘regionally threatened’). In their view this uncertainty casts doubt on the efficacy of the proposed salvage and relocation measures. Conversely, Mr Payne (representing the applicant) is of the view that the proposed salvage and relocation protocols will ensure that any residual adverse effects remain less than minor. There are two issues implicit in these positions, one relating to the adequacy of the surveys to detect lizards where they are present and the second relating to the adequacy of the lizard management proposed to address effects on lizards.

In relation to the first matter, wildlife survey never achieves complete detection of the target species. Imperfect detection results from cryptic behaviour and camouflage, low population densities, environmental and temporal behavioural changes and survey constraints. In my view the panel should treat assertions that a species is "absent" from all or part of the Site based purely on a lack of sightings with extreme caution. Under the precautionary principle, if suitable habitat exists and a protected species is known to reside in the wider area, the panel should assume the species may be present and ensure the management conditions protect it accordingly.

Salvage and relocation of lizards is widely seen as the best that can practicably be achieved for protecting lizards, but the survival and productivity of relocated lizards is likely to be poor or very poor, especially when only small numbers of individuals are relocated. Romijn and Hartley (2016) identified 85 translocations of 30 lizard taxa to 46 release sites in New Zealand between 1988 and 2013, one-third of which were mitigation-driven translocations, motivated by habitat loss due to development. Eight of those translocations (<10%) recorded population growth, including one mitigation-driven relocation to a predator exclusion fenced reserve. More recent research (Woolley et al. 2025) suggests this situation has not improved. I note Mr Payne’s description of his recent experience with successful lizard relocations (including copper skinks) in the Wellington region, but these results have not been published and therefore subject to peer review. The panel should give more weight to published, peer reviewed evidence where it is available. Given the published findings suggest outcomes are poor, efforts to salvage as many lizards as possible from all the habitats where they might occur and relocate them to the best quality habitat achievable (including effective and sustained pest control or other methods to reduce predation) would be precautionary.

Mr Payne has identified locations where lizards occur, but he has not confirmed the abundance of lizards at those locations nor has he reliably confirmed the absence of lizards at other locations.

Given the cryptic nature of copper skink, and its status as ‘regionally vulnerable’, adopting a uniform salvage methodology or only searching in known lizard habitats introduces a high risk of failure to adequately protect lizards through the works. In my view a precautionary approach would be to adopt a two-tiered adaptive framework as follows:

- Tier 1 (‘Defined Salvage Zone’): Applied to all high-value habitats and areas with confirmed lizard presence. This approach would require a minimum baseline salvage effort including a variety of methods and destructive searching (including machine assisted searching) prior to works with a minimum number of days with no captures required before searching ceases. Threatened lizards would be subject to higher intensity (and duration) efforts than common species.
- Tier 2 (‘Investigative & Escalation Zone’): Applied to lower-probability habitats which might still provide habitat to lizards or house fewer lizards. This approach would require active pre-clearance surveying and a clear 'trigger threshold' should be conditioned whereby the discovery of any indigenous lizard within a Tier 2 zone would automatically escalate the entire area of similar habitat to the Tier 1 salvage protocol.

In my view this approach would be consistent with best practice. I note that Mr Payne agreed to amend the Lizard Management Plan at conferencing, but I have not yet seen the updated plan so I am unaware what it contains.

Copper skink are cryptic, ground-dwelling lizards which are active intermittently day and night. They rarely bask in the open which contributes to their crypticity. Instead, they find warmth in dappled light and rely heavily on habitats that offer dense, continuous ground cover. There are four main habitats of copper skink, three of which are present at the Site:

1. Forest margins and shrublands where they occupy deep layers of leaf litter, rotting logs, and the shaded undergrowth with typically constant moisture levels;
2. Lowland grasslands and exotic scrub where they occupy unmanaged farmland, rough hillsides where the rank, thick, ungrazed grasses provide structural cover from predators. They use the deep thatch layer at the base of these grasses for hunting invertebrates;
3. "untidy" artificial habitats such as corrugated iron sheets, compost heaps, rock retaining walls, woodpiles, and overgrown garden borders.

These types of habitats are reasonably common at the Site, but not especially widespread, and should be targeted for lizard salvage. I note that Mr Payne has agreed to provide more detail about his search effort for lizards at the Site, including locations and time spent, but this information is not available yet.

The fourth habitat is coastal areas such as coastal escarpments, dune systems, and rocky shorelines where they occur just above the high-tide line underneath coastal driftwood, accumulated shoreline debris, native flax, and coastal vines such as *Muehlenbeckia*). This habitat does not occur at the Site

Aquatic Ecology

With respect to aquatic ecology, the application states that 560m of stream length (equivalent to 655 m² of stream habitat) will be removed. This extent of stream loss is agreed.

The applicant proposes 450m (600m²) of stream remediation at the Site. The application further proposes that the residual 110m (55m²) loss be offset at a 1:1.75 ratio. A further 450m of stream enhancement was proposed.

In response to comments from Dr Taylor (advising GWRC), Dr Keesing undertook a Stream Ecological Valuation ('SEV') in the unnamed tributary of Taupo Stream that would be piped to enable construction of the roundabout. This SEV was used to calculate an Environmental Compensation Ratio ('ECR') of 1.55 (i.e., for each 1m of stream removed 1.55m must be restored or enhanced to offset or compensate for the aquatic habitats lost).

Some of the stream loss is proposed to be offset via the retention wetlands (discussed in more detail below) which will provide potential habitat for at least some fish species. I note that technically this would not represent an offset because the habitats are not like for like. In my view this proposal represents mitigation, which I also discuss in more detail below.

Te Rūnanga o Toa Rangatira has raised concerns regarding the 110-metre culvert within Taupo Stream and stream alterations more generally. The National Policy Statement for Freshwater Management requires Councils (rather than individual applicants) to give effect to Te Mana o te Wai, which prioritises the health and well-being of the water first. Evaluating a stream purely via the SEV model ignores the cultural degradation of mauri (life force) caused by piping a stream, but I am not sufficiently experienced in how Te Mana o te Wai applies to FTAA applications to provide useful advice with respect to how the panel should balance these matters.

The invited parties have questioned whether stream enhancements downstream of the Site should be considered (particularly the replacement of two culverts that currently prevent fish passage). Given that these involve third parties, any requirements to address fish passage in these culverts would rely on voluntary third-party arrangements and could not be required via consent conditions.

There is a large body of research in New Zealand that points to the benefits and limitations of riparian planting for aquatic habitats. Benefits include:

- Water Quality Improvements – established riparian buffer zones can reduce overland sediment loss and phosphorus runoff in highly modified or pastoral catchments. A diverse mix of native sedges, grasses, and shrubs increases the physical "roughness" of the land and slows down sheet-flow during storm events, causing suspended fine silts to settle out on the banks before they can enter the water column and smother benthic habitats. In addition, deep-rooting native vegetation mechanically binds soil layers together. This reduces bank collapse and mass-movement events, particularly in steep, erosion-prone headwater areas.

- Temperature regulation - without shading, unplanted headwater streams regularly experience summer spikes above 20–25°C which is lethal to many native species. Riparian planting creates a canopy which shades streams reducing water temperature.
- Algae and aquatic macrophyte suppression – establishing a native canopy suppresses excessive growth of aquatic weeds (macrophytes) and toxic algal blooms by restricting solar radiation and maintaining dissolved oxygen levels compatible with other aquatic life.
- Terrestrial – aquatic habitat linkages – overhanging branches drop organic leaf litter and terrestrial invertebrates directly into the stream, providing food and habitat required by native fish species.

Whether the riparian planting and stream restoration proposed is sufficient to address the upstream catchment alterations, potential for sediment mobilisation during construction and the instream culverting proposed will depend on the quality, extent and maintenance of the planting within the context of the wider catchment. The literature suggests that riparian restoration is highly effective, but only when executed as part of a holistic catchment plan. Effective management (planting, weed management, pest control) will be required until ecologically appropriate targets are achieved and maintained.

Wetlands

With regard to wetlands, the application states that approximately 22,211 m² of natural inland wetland would be lost as a result of the proposal, of which:

- 6,900 m² would be remedied;
- 12,000 m² of existing wetland at the Site would be enhanced; and
- The residual loss of f 15,311 m² is proposed to be offset.

Offsetting is proposed at a 1:1 ratio, i.e., construction of 15,311 m² of wetland is required to achieve no loss of wetland extent. The offsetting is proposed to be provided via 'retention wetlands' constructed within the existing gully floors at five locations (A – E). These wetlands are proposed to have dual functions, viz managing stormwater and offsetting impacts on wetlands. The retention wetlands are to be created via construction of bunds (dams) to retain water in the affected areas. These locations are already occupied by wetlands and small streams, although the valley floors will be recontoured to increase capacity/extent.

There are at least two matters that the panel will need to consider in making a determination with respect to the suitability of the retention wetlands to form a suitable offset:

1) **Is what is proposed offsetting?**
   The Environment Court in Royal Forest and Bird Protection Society v Buller District Council at [72]-[76] distinguished mitigation, offsets and compensation from one another and concluded that:

   - 'mitigation' is any action that directly addresses environmental damage within the impact footprint;
   - 'offsets' are explicitly calculated positive actions, including those undertaken outside the direct impact footprint; and
   - 'compensation' is any positive offering from a development proponent that does not meet the other two definitions.

   Thus, the distinction between mitigation and offsetting depends on both geography and the nature of the proposed management action(s) as follows:

   - Mitigation: Actions taken on-site within the development footprint to reduce the immediate impacts of the project (e.g., planting native species in a degraded gully on the same farm).
   - Offsetting: A measurable conservation action taken to balance out a significant residual adverse effect that cannot be mitigated on-site.

   Because the applicant's proposed wetland creation and gully and riparian planting are entirely contained within the boundaries of the Site, my view is that it is more appropriately considered as on-site mitigation, not offsetting.

2) **Does it matter?**
   If the proposed planting and wetland creation is considered to be an offset, the National Policy Statement for Freshwater Management and the National Policy Statement for Indigenous Biodiversity direct how offsetting should be undertaken (noting that the two sets of principles are similar, but not identical and differ slightly from international best practice). The international principles of offsetting include additionality and transparency (via a BOAM or similar quantification or other scientifically acceptable method) and have as the explicit goal a net gain in biodiversity (which is like for like and must be measured and verifiable). Protection in perpetuity is another best practice principle. The current proposal would not meet those standards.
   Offsetting, at least theoretically, allows the total destruction of an ecosystem on one site in exchange for "fixing" or creating a similar ecosystem at a separate site (noting that there are limits to offsetting relating to irreplaceability and vulnerability). Mitigation accepts that the local ecosystem is being modified, but attempts to minimise the effects.
   Given the ecological context of the Mt Welcome site (highly degraded wetlands, limited indigenous vegetation, poor ecological connectivity and the presence of probably low numbers of indigenous fauna including birds and lizards), the second approach seems more reasonable and achievable and would appropriately seek to increase the extent and quality of indigenous vegetation and habitats and maintain (and ideally increase) species presence and connectivity across the Site.

In my view, the applicant has proposed mitigation (although called it offsetting). If the panel accept this view, whether or not offsetting is desirable (i.e., the residual effects are at a level that would be commensurate with offsetting being directed via one or both of the National Policy Statements) remains a matter to be addressed, particularly with respect to the ecological value of the indigenous planting and the retention wetlands (especially if future maintenance of them proves necessary to maintain their stormwater retention function).

Considering the proposed ecological management at the Site to be mitigation removes the need to demonstrate additionality, accept net gain models that imply an unwarranted level of precision and require verifiable like for like biodiversity gains. The outstanding residual effects of the Project once these mitigation actions have been undertaken are yet to be quantified, but this approach focuses the attention on the overall effects of the Project in the round (i.e., once all the mitigation actions have been considered) rather than focussing on offsetting before mitigation has been considered.

This matter would have been much more easily explored and understood had the applicant set out clearly how the mitigation hierarchy had been applied to the Project – what had been avoided, what was being remedied, what the mitigation actions were and then whether or not the residual effects warranted offsetting (or compensation). Given the almost universal difficulty of achieving true offsetting, exploration of compensation for residual adverse effects may have proved fruitful.

If the Panel concludes that what is proposed does constitute an offset, then I consider that there are at least five matters which would come to bear on the utility and ability of the retention wetlands in particular to provide that offset:

- They do not meet the offset principles – the dual purpose of the wetlands means that they are not strictly additional, they have not been the subject of a transparent quantification of loss and expected gain and they are not like for like.

- The ability of plants to survive the altered hydro-period remains unknown – Natural wetlands experience slow seasonal water level transitions. The proposed civil engineering design will subject these zones to "flashy" hydro-periods, i.e., water levels will spike during and immediately after rainfall events and then drop rapidly. This creates an unstable environment for native plants and could lead to weedy vegetation developing. This will require specific attention to plant selection to ensure that the plants selected can persist in the expected environment as well as (possibly prolonged or in perpetuity) attention to weed control to ensure that indigenous vegetation dominates in accordance with offsetting objectives.

- The potential for sediment deposition smothering the habitats created. Because the development sits on steep, highly erosion-prone headwater slopes, generation of construction-phase runoff poses a risk to both on-site habitats and the downstream Taupō Swamp unless adequately managed. Smothering will remove habitat for macroinvertebrates and reduce the filtration capacity of the wetland. This matter could be addressed via regular sediment removal (discussed below), but that will have implications for the vegetation and therefore the ongoing ecological value of the wetlands.

- Maintenance of fish passage – my understanding from the expert conferencing is that fish passage would be provided at all retention wetlands, which was not the case in the original application. Installation of impassable barriers should be avoided.

- If sediment removal was required in future to maintain wetland function, this would adversely affect the vegetation (and potentially the aquatic habitat values) for an unknown (and possibly variable) time immediately following the works. The gullies

are already receiving sediment from the upper slopes, but if this pattern materially changes (e.g., during construction as a result of the increased extent of bare soil or following construction due to an increase in impervious surfaces), this could have negative effects on not only the wetland vegetation and function, but also the planted areas on the slopes (e.g., if increased sheet flow affects plants there). If either of these changes results in increased sediment reporting to the retention wetlands then that poses a significant risk to the ecological outcome for the proposed wetlands. If the sediment accumulates to the point that sediment (and associated vegetation) removal is required, that poses an even bigger risk to achieving and sustaining positive ecological outcomes.

Biodiversity Offsetting and Compensation

The invited parties have been critical of the approach adopted by the applicant's ecologists to not employ a BOAM. As noted above, I am of the view that the proposal includes mitigation, rather than offsetting, and on that basis a BOAM would not be required. If the panel do not accept my view, I have provided the following information to assist their deliberation with respect to the reliability that can be placed on any BOAM offered.

The BOAM, the similar (but qualitative) Biodiversity Compensation Model ('BCM') and the SEV and ECR invoke greater transparency and structural accountability where more subjective arguments fail and are helpful tools when evaluating effects management.

The models inherently suffer from the illusion of precision and convey an unwarranted certainty which is usually not justifiable on ecological grounds. Rather than delivering absolute ecological truth, the primary advantage of these quantitative models is that they establish an auditable, rule-bound framework for decision-making by exposing hidden assumptions such as how long the planting will take to mature (temporal risk), the likelihood of planting failure (delivery risk) and the exact exchange ratios being applied. The models require a rigorous accounting of "like-for-like" or "like-for-equivalent" exchanges, preventing exchange of rare or high value attributes for more common (or easily delivered) ones. In terms of decision making, their main value is that they assist in creating enforceable consent conditions by providing explicit, numerical targets that can be directly written into consent conditions and used to trigger additional management to ensure effects are addressed.

The BOAM and BCM reduce hyper-complex, dynamic ecological systems into a single, algorithmic, unitless number. A model output indicating a net-gain ratio of, for example, exactly 1:4.2 implies an engineering-level accuracy that simply does not exist in nature. This approach masks the reality that ecology relies heavily on unpredictable and often uncontrollable variables like changing weather and climate patterns, pest invasions and population stochasticity. The outputs of all three models are entirely dependent on the quality of their inputs and the assumptions used to inform them ('rubbish in, rubbish out'). The BOAM and BCM also use standard discount rates to account for the decades it takes for a new forest to grow, but this does not capture the real-world impact on local fauna deprived of that habitat for that period of time e.g., if a lizard population loses its habitat today, a model's promise of a superior habitat in 30 years is functionally useless to the immediate survival of that localized population. These considerations formed part of the thinking for development of the BCM focused on compensation, rather than offsetting, because offsetting is almost never demonstrably achievable, and certainly not at the outset of a project.

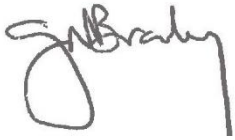
In my view, the panel should treat the BOAM framework as a structured accounting tool to assist in defining the problem and developing appropriate application of the effects management hierarchy and relevant conditions, not as crystal balls predicting exact ecological outcomes which can be relied upon. In other words, the panel should not accept

a positive numerical model output as definitive proof that an impact is 'acceptable' or that no net loss of biodiversity (or a net gain) is guaranteed. In my view the best way to use the BOAM output effectively is to use it to develop trigger conditions written into the approvals to ensure delivery of the expected ecological outcomes.

Conclusion

I trust that this assists your decision making with respect to this application. Please don't hesitate to contact me if I can be of further assistance.

Ngā mihi mahana



Dr Gary Bramley

Ecologist

References

Romijn, R.L. and Hartley, S. 2016. Trends in lizard translocations in New Zealand between 1988 and 2013. New Zealand Journal of Zoology 43: 191-210.

Woolley, C.K., Iorns, C.J., Sylvester, J., Nelson, N.J. 2025. Victims of ignorance: Gaps in the protection of endemic lizards during land use activities in Aotearoa | New Zealand. New Zealand Journal of Ecology 49(1). DOI: https://doi.org/10.20417/nzjecol.49.3606